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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,889	10/03/2003	Charles Lee Edwards	TH1647 02 (US)	2368

7590 03/24/2010
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EXAMINER

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ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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03/24/2010

PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHARLES LEE EDWARDS, KIRK HERBERT RANEY, and
PAUL GREGORY SHPAKOFF

Appeal 2009-007052
Application 10/678,889
Technology Center 1700

Decided: March 24, 2010

Before BRADLEY R. GARRIS, CHUNG K. PAK, and TERRY J. OWENS,
Administrative Patent Judges.

PAK, *Administrative Patent Judge.*

DECISION ON APPEAL

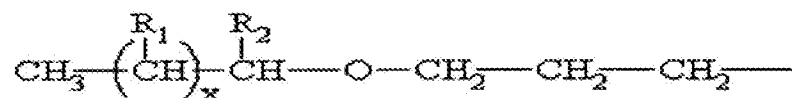
Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 57 through 74, all of the claims pending in the above-identified application. We have jurisdiction under 35 U.S.C. §§ 6 and 134.

STATEMENT OF THE CASE

The subject matter on appeal is directed to “a certain primary alcohol composition useful in producing detergent compositions” (Spec. 1, ll. 13-15). Details of the appealed subject matter are recited in representative claim 57 reproduced from the Claims Appendix to the Revised Appeal Brief (“App. Br.”) filed August 31, 2007 as shown below:

57. An alkyl ether sulfate composition comprising an alkyl ether sulfate represented by the formula:

XOSO₃M, wherein M is hydrogen or a cation, and X is represented by the formula



wherein R₁ represents hydrogen or a hydrocarbyl radical having from 1 to 3 carbon atoms, R₂ represents a hydrocarbyl radical having from 1 to 7 carbon atoms, x is a number ranging from 0 to 16, wherein the total number of carbon atoms in the alkyl ether sulfate ranges from 9 to 24.

As evidence of unpatentability of the claimed subject matter, the Examiner relies on the following sole prior art reference at page 3 of the Answer. (“Ans.”) dated December 21, 2007:

K. Tsujii et al, “Physiochemical properties of anionic surfactants with polyoxyalkylene group in water,” Tochigi Res. Lab., Kao Soap Co., Tochigi, Japan, Yukagaku, 30(9), pp. 566-571, 1981 (hereinafter referred to as “Tsujii”).

Appellants request review of the Examiner's § 103(a) rejection of claims 57 through 74 as unpatentable over the disclosure of Tsujii (App. Br. 2).¹

Appellants traverse the Examiner's § 103(a) rejection, arguing that the sulfate ester taught by Tsujii would not have rendered the claimed alky ether sulfates embraced by the formula recited in claim 57 *prima facie* obvious to one of ordinary skill in the art (App. Br. 2). Appellants also contend that the claimed alky ether sulfates impart unexpected results, thereby rebutting any *prima facie* case of obviousness established by the Examiner (App. Br. 2-4).

ISSUE AND CONCLUSION

The first dispositive question is: Would the sulfate ester taught by Tsujii have rendered the claimed alky ether sulfates encompassed by the formula recited in claim 57 *prima facie* obvious to one of ordinary skill in the art? On this record, we answer this question in the affirmative.

The second dispositive question is then: Have Appellants demonstrated that the claimed alky ether sulfates impart unexpected results, thereby rebutting any *prima facie* case of obviousness established by the Examiner? On this record, we answer this question in the negative.

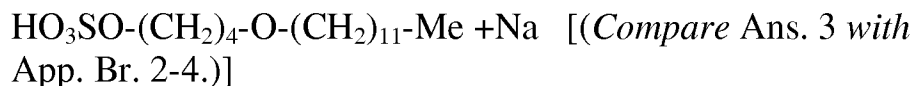
¹Appellants argue claim 57 only and do not separately argue the other claims on appeal (App. Br. 3-4). Therefore, for purposes of this appeal, we select claim 57 to decide the propriety of the Examiner's § 103(a) rejection set forth in the Answer. *See* 37 C.F.R. § 41.37(c)(1)(vii) ("When multiple claims subject to the same ground of rejection are argued as a group by appellant, the Board may select a single claim from the group of claims that are argued together to decide the appeal with respect to the group of claims as to the ground of rejection on the basis of the selected claim alone.").

RELEVANT FACTUAL FINDINGS

The following relevant factual findings are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office):

1. Appellants do not dispute the Examiner's finding that:

Tsujii et al teach physiochemical properties of detergent or surfactants of sodium salts of sulfate esters of alkoxyated C₁₂-C₁₈ fatty acid alcohols containing 1-8 oxyalkylene groups/mol. Furthermore, the surfactants containing polyoxyethylene groups have higher critical micelle concentrations compared with surfactants containing polyoxypropylene and polyoxybutylene groups (see abstract). The sulfate ester compound has the formula:



2. The sulfate ester formula taught by Tsujii is identical to the claimed alkyl ether sulfate formula, except that its additional methyl (CH₂) group is attached linearly to the alkyl group of its ether linkage (-CH₂-CH₂-CH₂-O-), rather than being attached to the same alkyl group as a branched methyl (CH₂) group as required by the claimed alkyl ether sulfate formula. (*Compare* the sulfate ester surfactant formula taught by Tsujii above *with* the alkyl ether sulfate formula recited in claim 57.)
3. Tsujii, like Appellants, is directed to forming a surfactant (detergent) composition that has excellent tolerance for calcium ions (*Compare* Tsujii, p. 566 *with* e.g., Spec. 6).
4. Tsujii exemplifies its surfactants having a calcium tolerance of at least 1000 ppm (p. 568).

5. Appellants rely on page 31 of the Specification which states in relevant part that:

The sulfated branched primary alcohol compositions of the invention have several orders of magnitude higher calcium tolerance over linear alkylbenzene sulfonates and branched alkyl sulfates having the same carbon number. [(Spec. 31, ll. 1-4.)]

6. Appellants also rely on the last paragraph of page 33 of the Specification which states:

In yet another independent embodiment of the invention, the branched ether surfactant compositions of the invention exhibit cold water detergency values of at least 22% measured at 50°F (10°C). In a preferred embodiment, the branched ether surfactant composition has a cold water detergency value of at least 28% measured at 50°F. In yet a more preferred embodiment, the sulfates of the branched ether primary alcohols, their derivatives, and their branched ether surfactant compositions simultaneously exhibit cold water detergency values of at least 22% at 50°F (10°C), Krafft temperatures of 10°C or less, more preferably 0°C or less, and has a calcium tolerance of 5000 ppm CaCl₂ or more. [(Spec. 33, ll. 19-31.)]

7. Appellants further rely on Examples A-C on pages 51 and 52 of the Specification which shows a comparison between C₁₂-1 PDOS, C₁₄-1PDOS, and C₁₆-1 PDOS (sulfated branched primary alcohols “derived from C₁₂, C₁₄, and C₁₆ branched primary alcohols”) supposedly representative of the claimed alkyl ether sulfate compositions, N23-S (sulfated NEODOL® 23, a sulfated linear alcohol mixture) and C₁₂ LAS (a C₁₂ linear alkyl sulfate) supposedly representative of prior art surfactant or detergent. (*See App. Br. 3-4, together with Spec. 51-52*).

8. According to page 52 of the Specification, the hardness tolerances (Ca ion) of C₁₂ LAS, N23-S, C₁₂-1 PDOS, C₁₄-1PDOS, and C₁₆-1 PDOS are 140 ppm, 18 ppm, greater than 120,000 ppm, 30,200 ppm, and 1,800 ppm, respectively. (*See also* App. Br. 3.)
9. Appellants do not refer to any comparison between the claimed alkyl ether sulfate detergent compositions and Tsujii's surfactant (detergent) composition comprising a sulfate ester compound having the formula: HO₃SO-(CH₂)₄-O-(CH₂)₁₁-Me +Na. (See App. Br. 2-4 and Spec. 31, 33, 51, and 52).
10. Appellants do not show or explain why N23-S (sulfated NEODOL® 23) and C₁₂ LAS representative of a C₁₂ linear alkyl sulfate are *structurally* closer to the claimed alkyl ether sulfate than the sulfate ester having the chemical structure: HO₃SO-(CH₂)₄-O-(CH₂)₁₁-Me +Na taught by Tsujii or are *structurally* equivalent to the sulfate ester having the chemical formula: HO₃SO-(CH₂)₄-O-(CH₂)₁₁-Me +Na taught by Tsujii (App. Br. 2-4).
11. Appellants do not demonstrate, much less explain, why the limited showing at pages 51 and 52 of the Specification is reasonably commensurate in scope with the protection sought by broader claim 57 (App. Br. 2-4).

PRINCIPLES OF LAW AND ANALYSIS

Appellants do not dispute the Examiner's finding at page 3 of the Answer that:

Tsujii et al teach physiochemical properties of detergent or surfactants of sodium salts of sulfate esters of alkoxylated C12-C18 fatty acid alcohols containing 1-8 oxyalkylene groups/mol. Furthermore, the surfactants containing polyoxyethylene groups have higher critical micelle concentrations compared

with surfactants containing polyoxypropylene and polyoxybutylene groups (see abstract). The sulfate ester compound has the formula: $\text{HO}_3\text{SO}-(\text{CH}_2)_4-\text{O}-(\text{CH}_2)_{11}-\text{Me} + \text{Na}$

The sulfate ester formula taught by Tsujii is identical to the claimed alkyl ether sulfate formula, except for the location of one methyl (CH_3) group attached to the alkyl group of the ether linkage ($-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{O}-$). The sulfate ester formula taught by Tsujii, like the claimed alkyl ether sulfate compound, has the same detergent utility and is selected for its excellent tolerance for calcium ions (hardness tolerance).

Given the similarities of chemical structures, functions, and properties between the claimed and prior art detergent, we concur with the Examiner that one of ordinary skill in the art would have been led to employ the claimed alkyl ether sulfate detergent (surfactant), in the expectation that such similar detergent will have similar properties as that of Tsujii. *See In re Payne*, 606 F.2d 303, 313-14 (CCPA 1979) (When the prior art compound (a prior art ring structure having one or three carbon atoms between two sulfur atoms) and the claimed compound (the claimed ring structure having two carbon atoms between two sulfur atoms) are structurally similar and are used for the same purpose (pesticidal), the required motivation to make the claimed compound is present.); *In re Gyurik*, 596 F.2d 1012, 1018 (CCPA 1979) (When the similarity in chemical structures and functions between the prior art and claimed compounds is sufficiently close, a prima facie case of obviousness is established.); *see also In re Albrecht*, 514 F.2d 1385, 1388 (CCPA 1975); *In re Murch*, 464 F.2d 1051, 1054 (CCPA 1972); *In re Hoch*, 428 F.2d 1341, 1343 (CCPA 1970).

Appellants' reliance on the experiments shown at pages 51 and 52 of the Specification as demonstrating unexpected result over the closest prior

art, Tsujii, is misplaced. In particular, Appellants do not direct us to any comparison in the form of experiments between the claimed invention against the closest prior art reference, Tsujii, wherein the actual difference (i.e., the location of one methyl (CH_3) group attached to the alkyl group of the ether linkage ($-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{O}-$) of the alkyl ether sulfate detergent) is shown to impart unexpected results. Nor do Appellants direct us to any comparison between the chemical structures of N23-S (sulfated NEODOL® 23) and C_{12} LAS (a C_{12} linear alkyl sulfate) supposedly representative of prior art detergents and the chemical structure of the sulfate ester detergent taught by Tsujii to demonstrate that N23-S (sulfated NEODOL® 23) and C_{12} LAS are either *structurally* closer to the claimed alkyl ether sulfate than the sulfate ester taught by Tsujii or *structurally* equivalent to the sulfate ester taught by Tsujii. This is especially compelling in this case since the sulfate ester taught by Tsujii is said to have a calcium tolerance of *at least* 1000 ppm, which is much higher than those of N23-S (sulfated NEODOL® 23) (a calcium tolerance of 18 ppm) and C_{12} LAS (a C_{12} linear alkyl sulfate) (a calcium tolerance of 140 ppm). Thus, on this record, we concur with the Examiner that Appellants have not shown that the claimed invention imparts unexpected results relative to the closest prior art, Tsujii, either directly or indirectly. *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) (“[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.”).

In addition, Appellants’ reliance on the experiments shown at pages 51 and 52 of the Specification does not demonstrate that all the detergent compositions included in the claims on appeal as represented by claim 57

exhibit the alleged unexpectedly improved calcium tolerance. While the experiments shown at pages 51 and 52 of the Specification are limited to three specific sulfated branched primary alcohols supposedly representative of the claimed detergent compositions, the claims on appeal are not so limited. Yet, Appellants have not shown, much less explained, why such showing is reasonably commensurate in scope with the degree of protection sought by the claims on appeal. *In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983); *In re Clemens*, 622 F.2d 1029, 1035 (CCPA 1980).

Finally, Appellants' reliance on the statements at pages 31 and 33 of the Specification as demonstrating unexpected result is without merit. As our reviewing court has emphasized repeatedly in *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984), *quoted with approval in In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995):

It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice.

This is especially compelling in this case since the closest prior art, Tsujii, like Appellants, also states that its ester sulfate, like the claimed the alkyl ether sulfate, evinces the enhanced calcium ion tolerance.

It follows that Appellants, on this record, have not carried their burden of showing that the claimed invention as a whole imparts unexpected results relative to the closest prior art. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972) (The burden of demonstrating unexpected results is on the party who is asserting them). The Examiner's view concerning the insufficiency of the proffered evidence is supported by the record.

Appeal 2009-007052
Application 10/678,889

Accordingly, based on the totality of record, including due consideration of Appellants' arguments and evidence, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103.

ORDER

In view of the foregoing, the decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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